

Improved accessibility to geoscience information

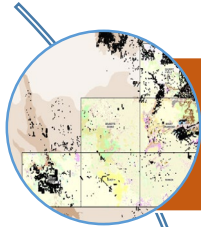
Tracey Rogers

Northern Territory Geological Survey



NORTHERN TERRITORY GEOLOGICAL SURVEY
AGES2024
ANNUAL GEOSCIENCE EXPLORATION SEMINAR
16–17 April 2024, Alice Springs, Northern Territory

Topics



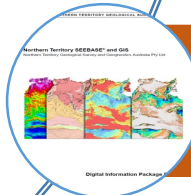
Industry drilling and geochemistry data



Online delivery/web updates



Petroleum industry reporting and data

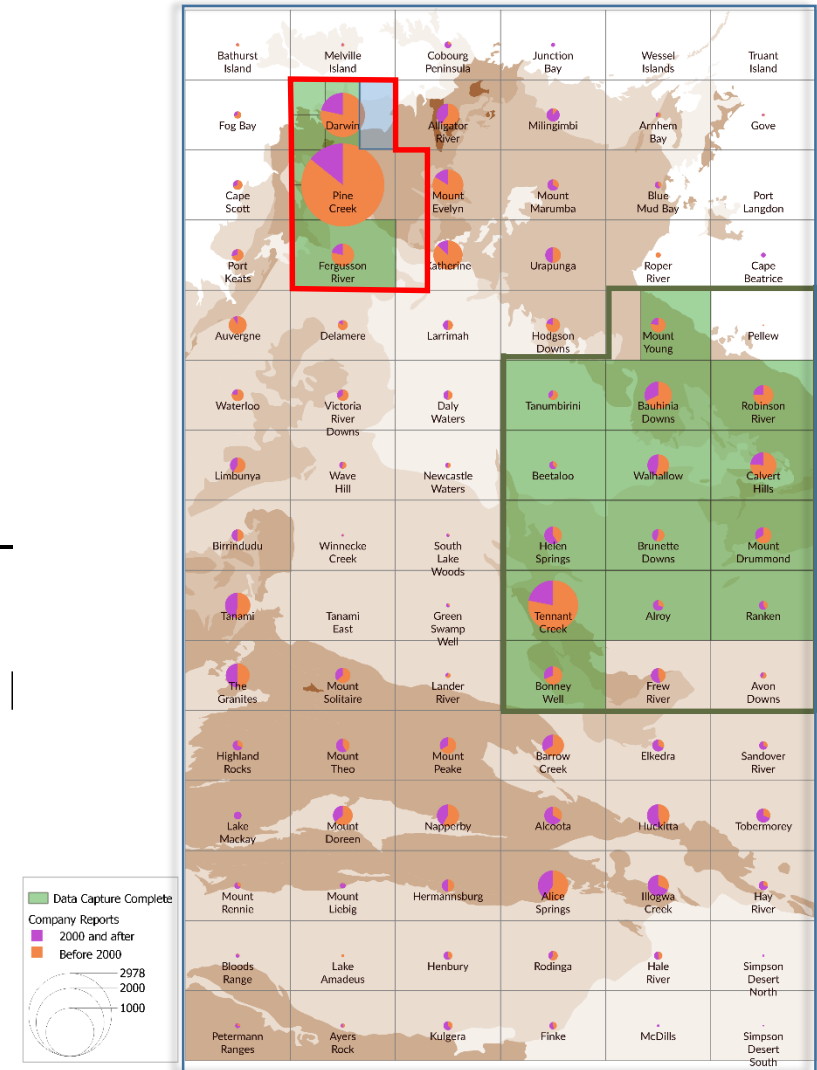


Recent releases

Legacy drilling and geochemical data capture – recent progress

Pine Creek region priority area

- Pine Creek 250k map sheet
 - 444 reports completed across Daly River, Reynolds River and Tipperary 100k map sheets – data released Mar 2024
- Darwin 250k map sheet
 - 269 reports completed on Bynoe, Darwin 100k map sheets - data released Sep 2023
 - 276 reports captured on Koolpinyah-Noonamah – released 2024
- Point Stuart – Mary River (199 reports) – data capture in progress



Legacy drilling and geochemical data capture – current status

- At commencement estimated ~ 12,100 reports on ceased titles across the NT with no existing data in the database
- Initial focus on the Tennant Creek and Barkly Regions – estimated ~ 2900 reports
 - Data capture completed 2018 to 2022
 - Moved to new focus area before all of area covered
 - Captured ~2130 reports
- Current priority area is the Pine Creek region
 - a very high concentration of reports (~5000)
 - data capture commenced in 2022
 - 1315 reports captured and data released (as at April 2024)
 - 199 reports in progress

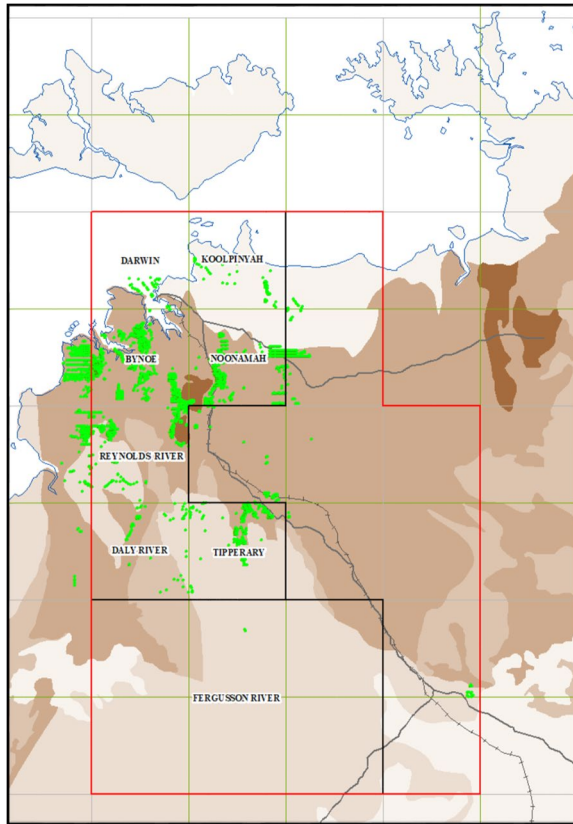


	DIP 001	DIP 001	2023-2024
Data Type	April 2023	April 2024	Release
Drill hole collars	262,200	286,800	24,600
Drill samples	1,723,000	1,942,500	169,500
Surface samples	450,900	518,100	67,200

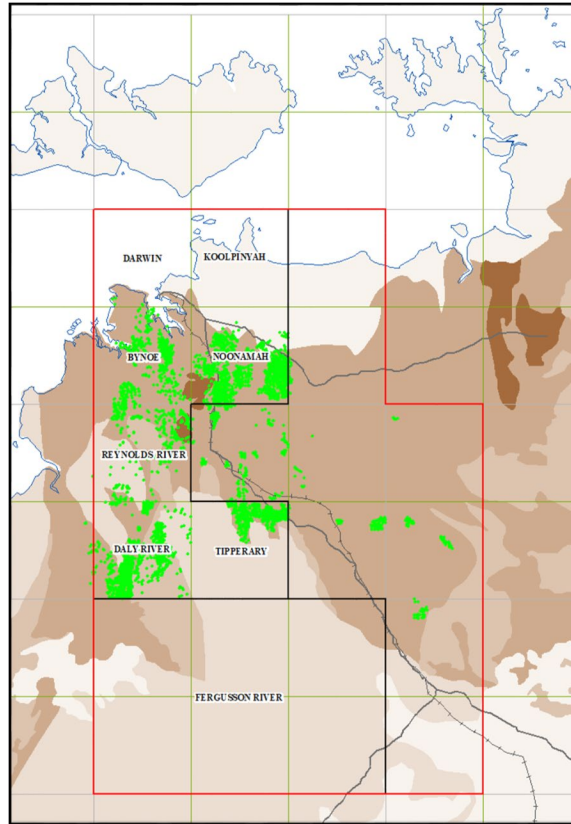
Note: figures rounded to nearest hundred

Drilling and geochemistry data releases – Pine Creek area

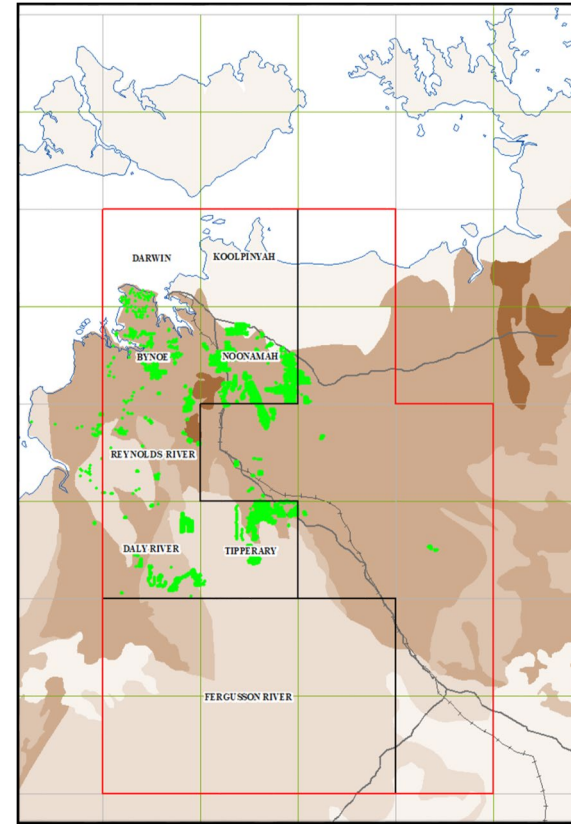
DRILL HOLES



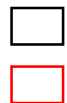
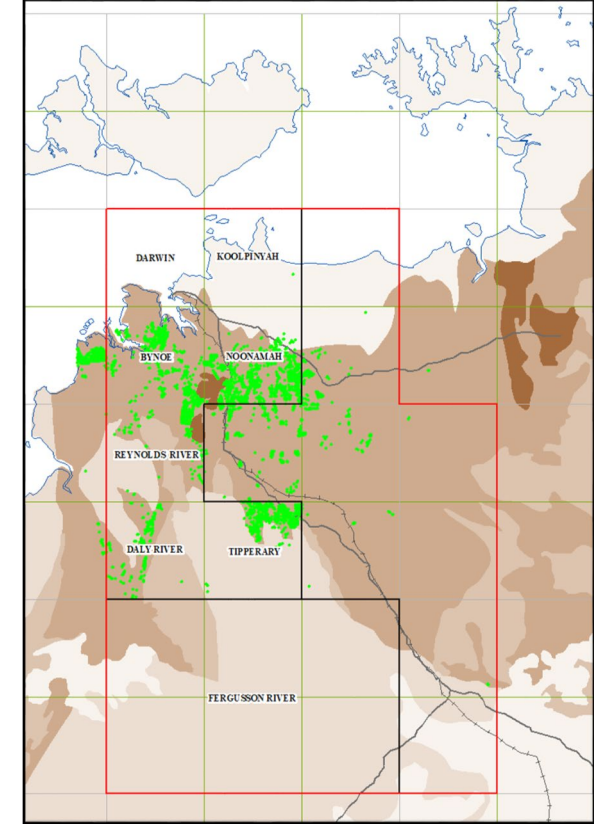
STREAM SEDIMENT SAMPLES



SOIL SAMPLES



ROCK / ROCK CHIP SAMPLES



Completed map sheets

Priority area boundary

Data released between April 2023 and March 2024

STRIKE – new layers and basemaps

New layers:

Petroleum Designated Area
(red boundary)

Bottom Hole Temperature

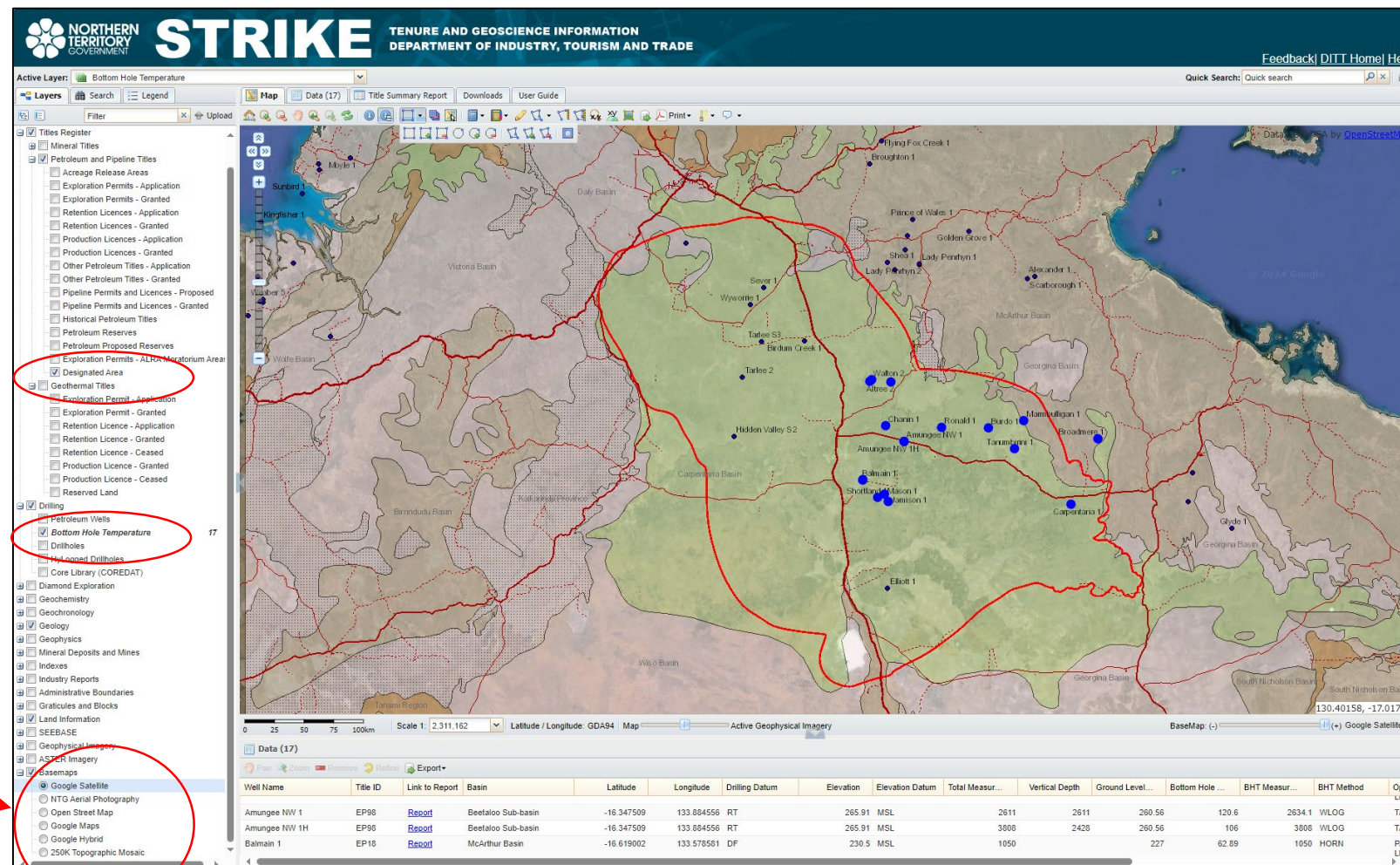
New basemaps:

Google Satellite

Google Maps

Google Hybrid

Open Street Maps



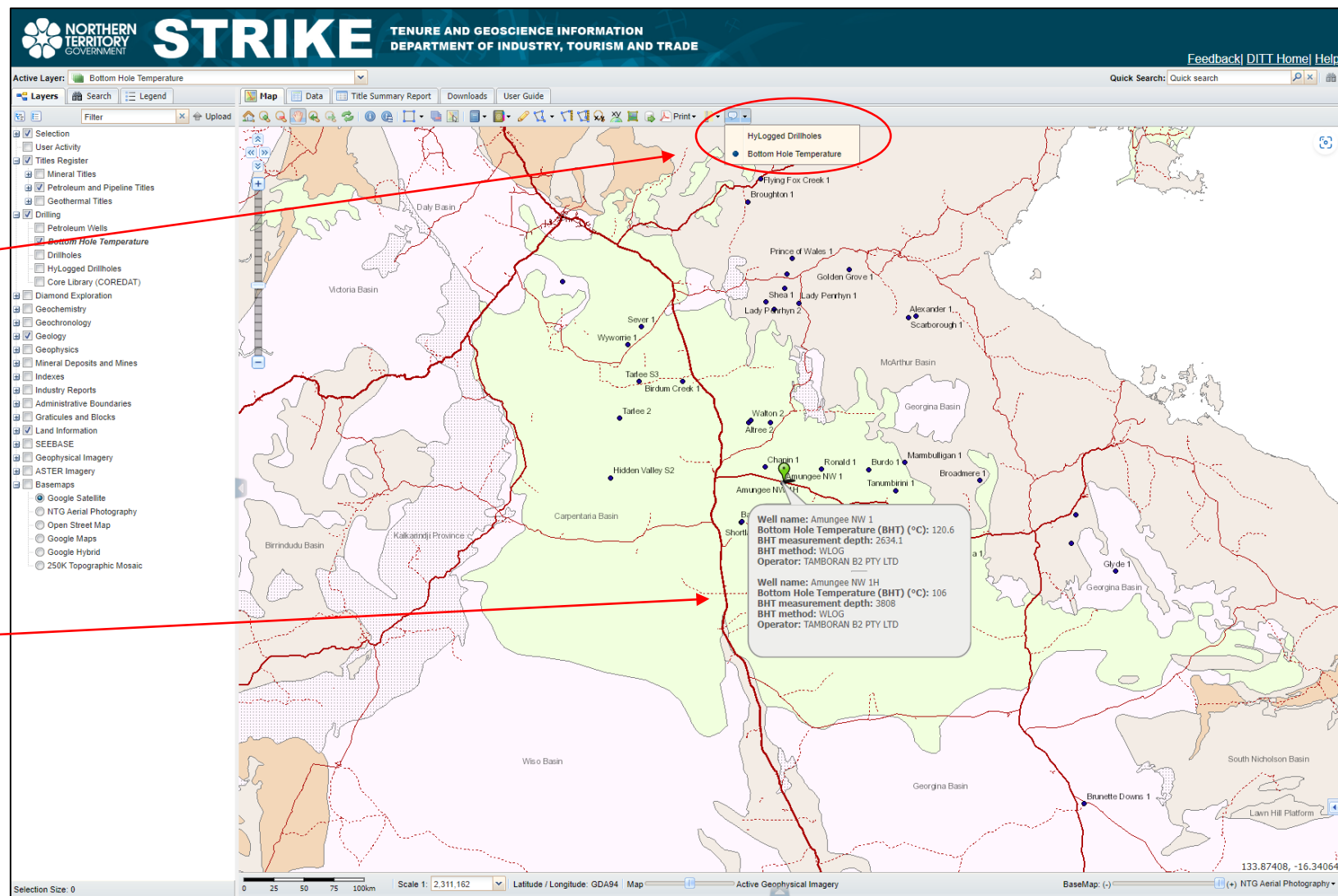
STRIKE – map tips

Available for selected layers

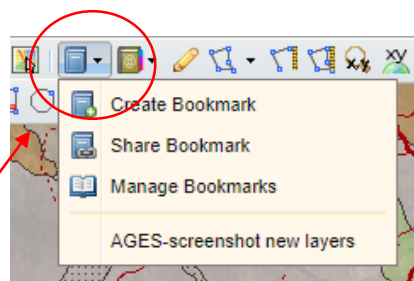
HyLogged Drillholes

Bottom Hole Temperature

Pop up callout appears as
cursor moves over objects
in the specified layer



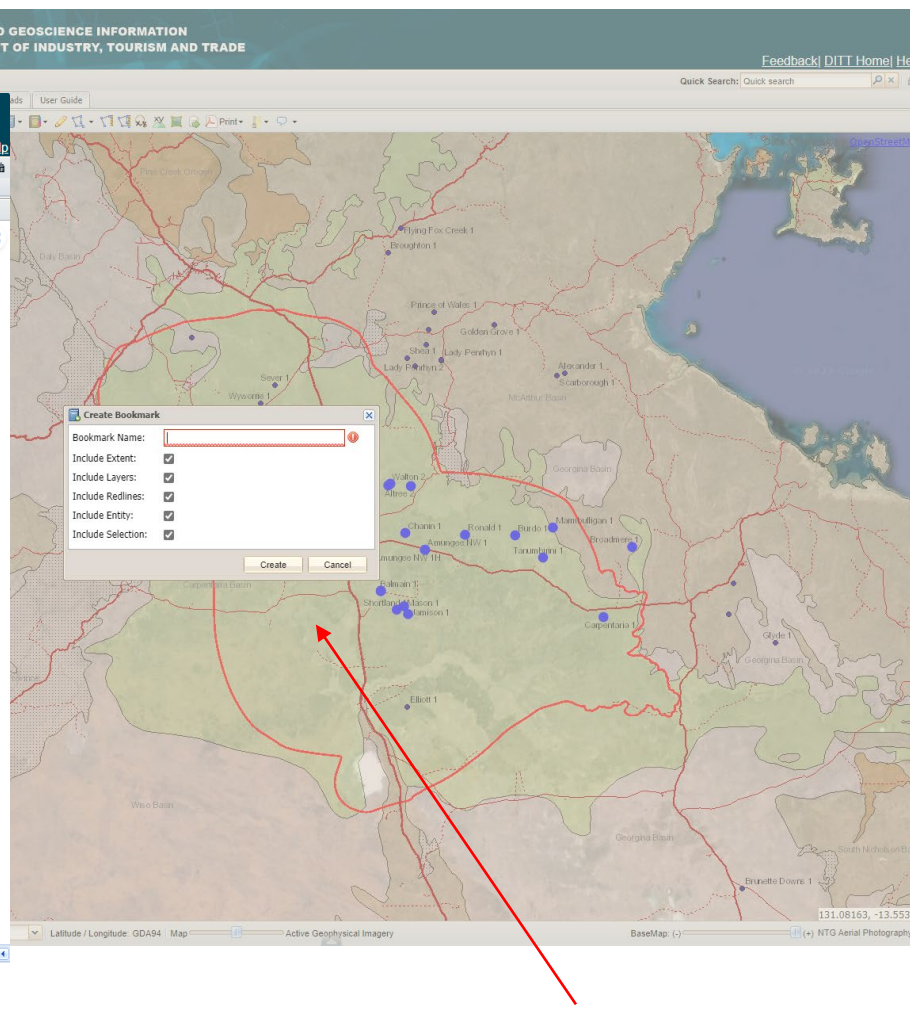
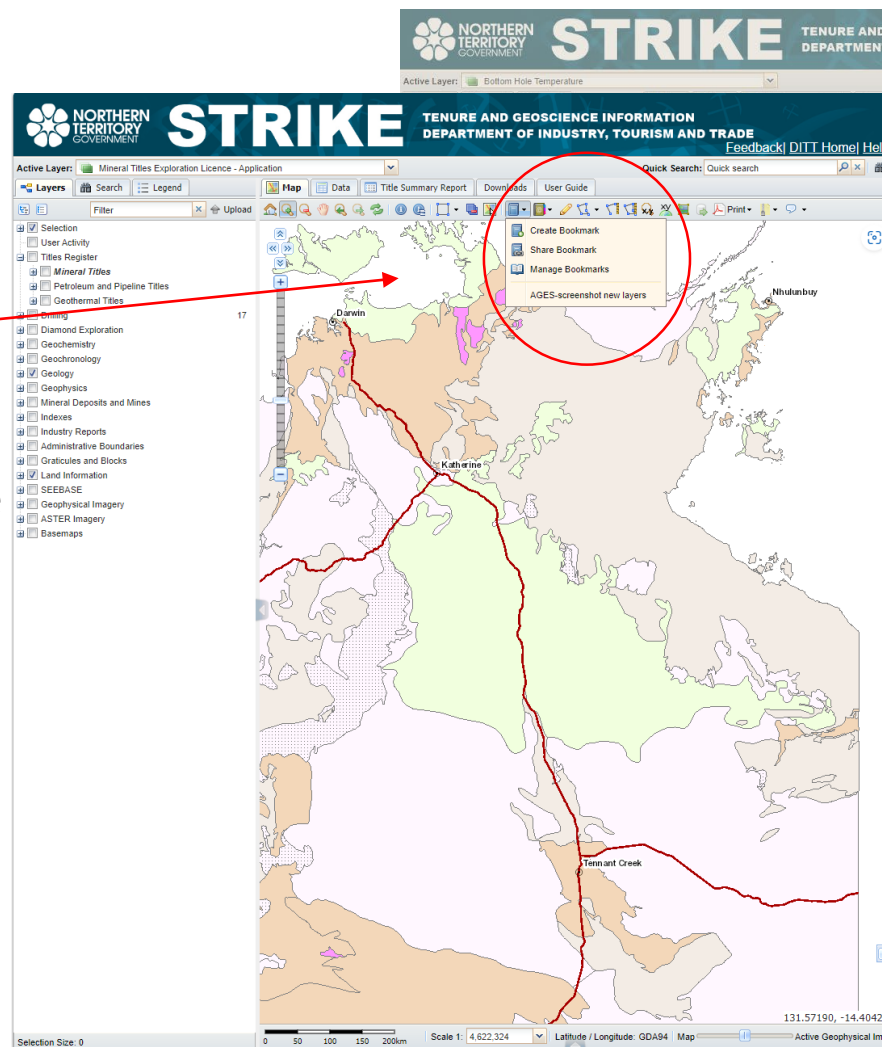
STRIKE – custom user bookmarks



Access via tool bar

User-created bookmarks are listed at the bottom of the dropdown menu – select to use

Share Bookmark – creates hyperlink that can be copied or emailed



Create Bookmark popup
- Add name and click Create

GEMIS GEOSCIENCE EXPLORATION AND MINING INFORMATION SYSTEM

Home Browse Contact Us Download(2) Request Help Search GEMIS Sign on to:

Search

Search: NTGS Products
for
Current filters: Collection Equals Reports, Records, Books
Start a new search

Add filters:
Use filters to refine the search results.
Report ID Equals
Add

Results/Page 50 | Sort items by Date Added In order Descending Authors/record All Update

Save to Endnote/RefWorks Save to Excel/CSV

Results 1-50 of 346 (Search time: 0.004 seconds).

previous 1 2 3 4 ... 7 next

Item hits:

Year	Title	Title Holder/Company	Report id	Download
2024	Critical Minerals in the Northern Territory 2024	-	-	1 file Select
2023	Summary of results. NTGS laser ablation ICP-MS zircon and monazite age constraints on copper mineralisation in the Aileron Province	-	NTGS Record 2023-011	1 file Select

Discover

Document Type

NTGS Record	178
NTGS Technical Report	85
Book Chapter	42
NTGS Report	21
Book	10
GIS Data	5
100k Geological Map	4
NTGS Technical Note	4
Presentation	4
Explanatory Note	3

next >

Geological Province

Aileron Province	42
Amadeus Basin	45
Arafura Basin	4
Arnhem Province	7
Arunta Region	76
Beetaloo Sub-basin	6
Birrindudu Basin	13
Bonaparte Basin	4
Canning Basin	3

GEMIS enhancements

Search results page changes:

- Default number of results displayed increased from 10 to 50
- Results default sort order now "Date added" (newer items are displayed first)

Improved GEMIS record display

Record display changes:

- Two column layout
- Downloads moved to the top for easier access
- Simpler display – fewer attributes
- View lengthy text fields using scroll bar
- Option to see all attributes

Before

Now

Click button to access all attributes

The screenshot shows the 'Annual Report for Exploration Licence 24915 Dufaur Lake Mackay Project from 1 November 2015 to 22 September 2016'. The interface is a two-column layout. The left column contains metadata: Title Holder / Company (ABM Resources Independence Group), Report id (CR2016-0560), Tenure (EL24915), Year (2016), Author (Winzar, DJ), and Abstract (Independence Group NL, Perth (IGO) is currently earning in to a joint venture covering this tenement and adjoining tenement applications that encompass ABM's Lake Mackay Project. IGO is currently exploring the Lake Mackay Project for gold and base metals. Exploration during the reporting period consisted of tenement wide geological mapping, 634 infill surface geochemical samples, 50 rock chip samples, 70.4 line km of moving logs). The right column is titled 'Files in this Report:' and contains a table of files with columns for File, Size, Format, and Add to Download. The table lists several PDF and ZIP files, including 'EL24915_2016_A_01.pdf', 'CR2016-0560_EL24915_2016_A_16_File_Listing.pdf', and various appendices. At the bottom of the right column are buttons for 'Download Selected', 'Add to Request', 'Clear Requests', and 'Submit Request'. A 'Show full item record' button is located at the bottom left of the main content area. The top navigation bar includes 'Home', 'Browse', 'Contact Us', 'Download(2)', 'Request', and 'Help', along with a search bar and a 'Sign on to' dropdown.

File	Size	Format	Add to Download
EL24915_2016_A_01.pdf	2.49 MB	PDF	<input type="checkbox"/> Add
CR2016-0560_EL24915_2016_A_16_File_Listing.pdf	84.29 kB	PDF	<input type="checkbox"/> Add
CR2016-0560_Appendix1.zip	100.62 kB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix2.zip	1.14 MB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix3.zip	2.36 MB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix4.zip	6.4 MB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix7.zip	787.97 kB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix8.zip	73.35 kB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Appendix9.zip	133.35 kB	ZIP	<input type="checkbox"/> Add
CR2016-0560_Geophysics.zip	2.21 MB	ZIP	<input type="checkbox"/> Add

The screenshot shows the 'Item Details' page for the same report. It features a single-column layout with a long list of attributes on the left and a 'Files in this report' table at the bottom. The attributes include Drillhole/Well Name, Map100, Map250, Geological Province, Tenure, Title Holder / Company, Spud date, Rig release date, Title, Corporate Author, Report Id, Subjects, Date, Bottom hole formation, Report Type, and Appears in Collections. The 'Files in this report' table lists the same files as the new interface. A red arrow points from the 'Show full item record' button in the new interface to the 'Subjects' attribute in this old interface, indicating that the old interface required clicking on a specific attribute to view all details.

File	Size	Format	Add to Download Cart
PR1963-0024_01_Cover_Contents.pdf	96.87 kB	PDF	<input type="checkbox"/> Add
PR1963-0024_02_Summary_Introduction_WellHistory.pdf	470.97 kB	PDF	<input type="checkbox"/> Add
PR19630024_03_Geology.pdf	554.67 kB	PDF	<input type="checkbox"/> Add
PR19630024_04_Appendices.pdf	1.47 MB	PDF	<input type="checkbox"/> Add
PR19630024_05_Illustrations.pdf	558.23 kB	PDF	<input type="checkbox"/> Add
PR19630024_06_Alice-1Logs.pdf	2.41 MB	PDF	<input type="checkbox"/> Add

Resourcing the Territory website - updates

Minerals pages

Mineral industry development:

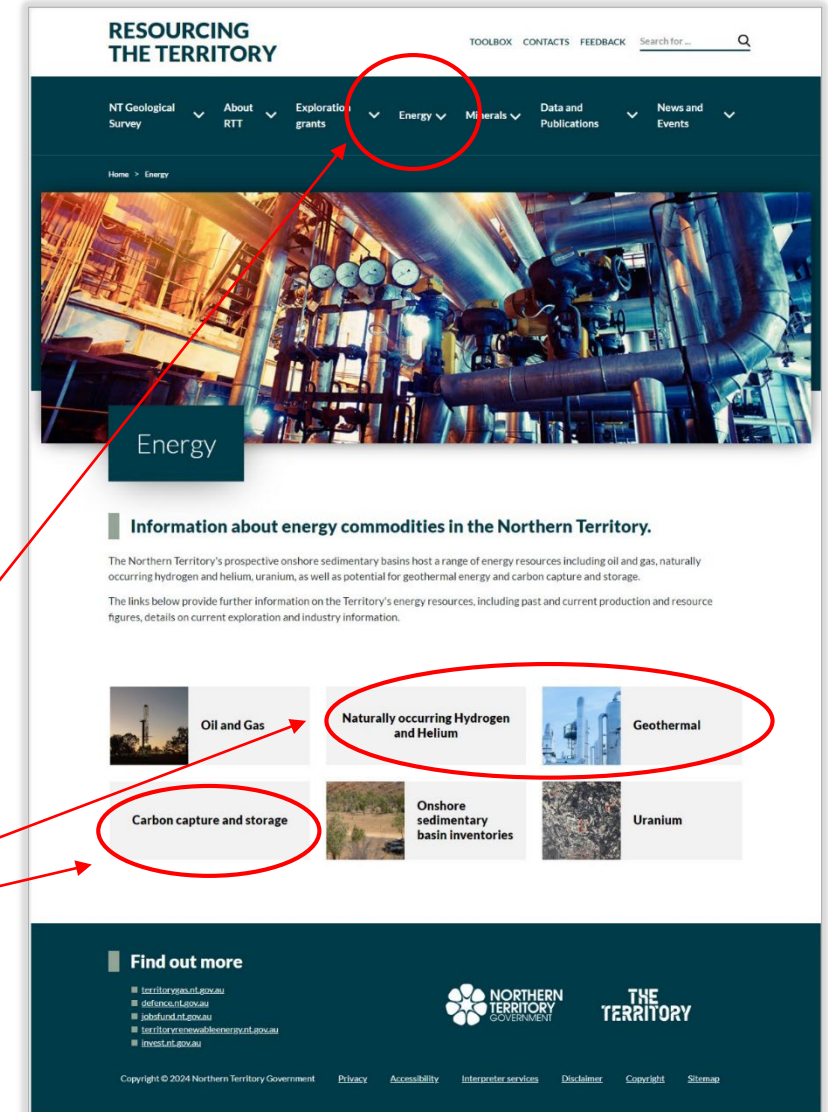
Taskforce recommendations -
implementation plan 2023 – 2026

New/updated Mineral
Commodity pages:

Lithium, REE, Nickel, Graphite,
Vanadium,
Tungsten/Molybdenum

Access the Energy
pages

NEW



Resourcing the Territory – Energy commodities

Energy pages

RESOURCING THE TERRITORY

TOOLBOXCONTACTSFEEDBACKSearch for...

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About RTT

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Energy

Minerals

Data and Publications

News and Events

Oil and Gas

- Producing basins
- Advanced basins
- Frontier basins
- Conventional oil and gas
- Shale gas and liquids
- Onshore exploration activity

Naturally occurring Hydrogen and Helium

Geothermal

Carbon capture and storage

Onshore sedimentary basin inventories

- McArthur Basin
- Beetaloo Sub-basin
- Amadeus Basin
- Onshore Bonaparte Basin
- Georgina Basin
- Pedrika Basin

Uranium

New and updated

Information about energy commodities in the Northern Territory.

The Northern Territory's prospective onshore sedimentary basins host a range of energy resources including oil and gas, naturally occurring hydrogen and helium, uranium, as well as potential for geothermal energy and carbon capture and storage.

The links below provide further information on the Territory's energy resources, including past and current production and resource figures, details on current exploration and industry information.

<https://resourcingtheterritory.nt.gov.au/energy>

RESOURCING THE TERRITORY

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Energy

Minerals

Data and Publications

News and Events

Home > Energy > Onshore sedimentary basin inventories > McArthur Basin

Palaeoproterozoic McArthur Basin

The Palaeoproterozoic McArthur Basin contains a number of petroleum systems, with exploration activity focussed on the Barney Creek Formation within the McArthur Group. Within the McArthur Basin, lies the Mesoproterozoic Beetaloo Sub-basin.

Quick facts

Size	180,000 km ²
Thickness	Up to 12 km
Petroleum Wells	37 (excludes wells targeting Beetaloo Sub-basin)
Seismic lines	>9000 km 2D (includes Beetaloo Sub-basin)
Status	Advanced basin
Contingent resources	6.0 bcf gas (excludes Beetaloo Sub-basin)
Age	Late Palaeoproterozoic

Overview

The McArthur Basin contains a number of conventional and unconventional petroleum systems within four petroleum super-systems, with most activity to date focussing on the late Palaeoproterozoic McArthur Group within the Batten Fault Zone in the southern McArthur Basin. Separate to this is the Mesoproterozoic Roper Group stratigraphy within the Beetaloo Sub-basin, a structural sub-surface sub-basin of the McArthur Basin, which hosts the Northern Territory's premier shale gas play.

Further information can be found on the Beetaloo Sub-basin inventory page.

Geological setting

Exploration history

Prospectivity

Contingent resources

Recent activity

Reports, data and references

Home > Energy > Naturally occurring Hydrogen and Helium

Naturally occurring Hydrogen and Helium

Known accumulations of naturally occurring hydrogen and helium exist within the Amadeus Basin.

Process

Naturally occurring hydrogen and helium are both non-hydrocarbon gases. Similar to conventional oil and gas, accumulations of these non-hydrocarbon gases may be found in geological traps within a porous and permeable reservoir.

Both hydrogen and helium can be a component of natural gas along with hydrocarbons and other non-hydrocarbon gases such as carbon dioxide, hydrogen sulphide and nitrogen. However, there are examples globally and in Australia where these gases are trapped without associated hydrocarbon-rich natural gas.

Unlike other natural gas components, naturally occurring hydrogen and helium are not generated from the breakdown of organic material over geological time. Hydrogen is commonly produced from water radiolysis of igneous rocks or through serpentinisation of ultramafic rocks. Helium is commonly produced by the decay of radiogenic material sourced from granitic rocks in the Earth's crust. These rocks are commonly most abundant in Proterozoic granitic rocks and are subsequently transported into sedimentary basins through groundwater interactions.

Naturally occurring hydrogen is different to renewable hydrogen that can be produced using electricity from renewable energy such as solar power. View the Northern Territory renewable hydrogen strategy.

Prospectivity

High levels of naturally occurring hydrogen and helium have been recorded from the Amadeus Basin in Neoproterozoic sub-salt plays within the basal Heavitree Formation and fractured

Onshore exploration activity

Petroleum exploration activity in the onshore basins of the Northern Territory is mostly focused on the Beetaloo Sub-basin and the Amadeus Basin. Exploration for sub-salt and intra-salt plays for helium and hydrogen accumulations is also focused on the Amadeus Basin.

Up to date information from the energy industry is captured through Exploration News.

Overview

Onshore petroleum activity in the Territory in 2022 was largely focused on appraisal of dry shale gas plays in the Beetaloo Sub-basin as the basin moves towards commercial production. Four new wells were drilled and three wells underwent continued stimulation and flow testing in the Beetaloo Sub-basin. One new exploration well was also drilled at the Palm Valley field in the Amadeus Basin. There are currently 37 granted exploration licences for petroleum in the onshore Northern Territory.

Petroleum exploration expenditure for 2022 was \$140.4 million, according to the Australia Bureau of Statistics (ABS). The ABS do not provide a breakdown of offshore vs onshore for petroleum expenditure in the NT.

Since 2010, around 70 exploration and production wells have been drilled onshore in the Northern Territory and exploration seismic data has been acquired in the McArthur, Amadeus, Pedrika and Georgina Basins. Read on for a detailed review of exploration activities in 2022.

View onshore exploration and production map in the NT. PDF (4.5 MB).

View the current NT onshore petroleum titles and land status map. PDF (4.2 MB).

Exploration summaries by basin


The following summaries include key exploration results from onshore basins between January 2022 and March 2023.

Beetaloo Sub-basin

Santos Ltd have exploration tenure in the eastern Beetaloo Sub-basin in joint venture with Tamboran Resources Ltd. During 2022, Santos continued flow-testing at the Tanambirini-2H and Tanambirini-3H horizontal wells in EP161, which were drilled in 2021 to a total depth of 4598 m and 4857 m respectively. In July 2022, the wells were opened following the installation of production tubing. Following re-opening of the wells, the Tanambirini-3H well delivered an average 30 day (IP30) flow rate of 3.1 million standard cubic feet per day (mmscfd) over a 600-metre completed horizontal section (normalised at 5.2 mmscfd over 1000-metres). Tanambirini-2H delivered an average IP30 flow rates of 2.1 mmscfd over a 660-metre completed horizontal section (normalised at 3.8 mmscfd over 1000-metres). In September 2022, the unfractured gas 2C well was drilled to a depth of 1116 m and flowed at 1.1 mmscfd.

Amadeus Basin

In April 2022, Central Petroleum Ltd, with its joint venture partners New Zealand Oil and Gas Limited and Cue Resources Limited, spudded the Palm Valley 12 well, which was originally intended to target a deep exploration target in the Amadeus Sandstone. However, after encountering challenging drilling conditions, the well was revised to focus on near-term production options in the Pacoota Sandstone. A sidetrack in the Pacoota P2 and P3 units was abandoned in August 2022, and the well was side-tracked to test the shallower Pacoota (P1) Sandstone at ~1770 m depth. The PV12 ST2 lateral appraisal well was drilled to a measured depth of 2039 m in the P1 sandstones in early October and flowed at 1.1 mmscfd when

 NORTHERN TERRITORY GOVERNMENT

resourcingtheterritory.nt.gov.au

AGES2024

Petroleum Act reporting amendments

- The *Petroleum Legislation Amendment Act 2022* received assent 16 December 2022
- The changes to the *Petroleum Act 1984* and the *Petroleum Regulations 2020* came into force on 22 June 2023
- The “Schedule of Onshore Petroleum Exploration and Production” has been revoked.
- Requirements for reporting and sample submission and release of information are clearer and simpler
 - All technical reporting separated from annual report with specific submission time frame
 - Initial and final well completion reports to both be released at the same time, 2 years after rig release
 - Core and cutting samples must be offered to the Minister (department) within 6 months after rig release
 - Interpretative reports and data to be released 4 years after the due date for submission
- *Guidelines for Northern Territory petroleum reporting and data submission* updated and released in September 2023



Digitisation of petroleum data

Digitising hard copy well logs and seismic sections in industry reports is essentially complete

- Digitised logs of 35 production wells in the Amadeus Basin and released digital logs from another 18 East Mereenie wells
- Digitising of available logs from all wells is now complete
- Vectorised 191 sections from 5 seismic surveys in the Amadeus, Bonaparte and Ngalia basins
- All data has been added to PEX Wells or PEX Geophysics and is available for download via GEMIS
- One additional seismic survey suitable for digitising identified



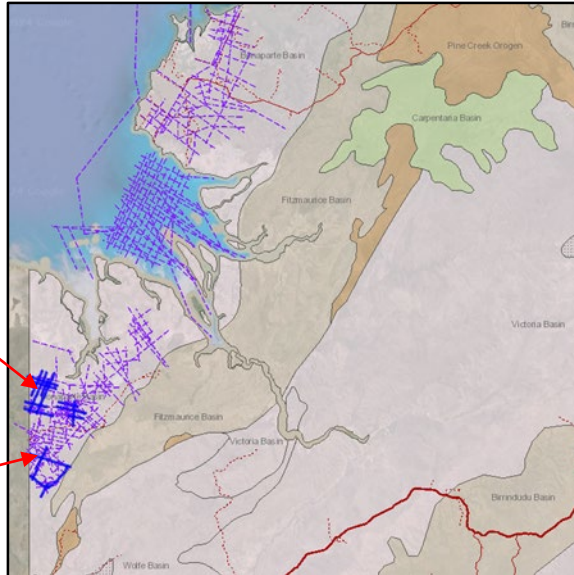
Source: Imperial Oil & Gas, PR2022-W010

A screenshot of the GEMIS (Geoscience Exploration and Mining Information System) web interface. The interface is dark-themed with a green header bar. The main content area shows a report titled 'Moyle 1 Log Data'. The report details include: Title Holder / Company: Associated Australian Oil Field; Report id: PR2022-W014; Tenure: CIP2; Year: 2022; Corporate Author: AVANTIX; Drillhole/Well Name: Moyle 1; Rig release date: 15/08/1996; Document Type: Well Logs; Date Added: 11-Jul-2022; Appears in Collections: Petroleum Wells (PEX Wells). On the right side, there is a table titled 'Files in this Report' with columns for File, Size, Format, and Add to Download. The table lists several files, including 'Moyle1_GAMM-NEUT-2to100-Run1.LAS', 'Moyle1_GAMM-NEUT-5to100-Run1.LAS', 'Moyle1_IND-ELEC-2to100-Run1.LAS', 'Moyle1_IND-ELEC-2to100-Run2.LAS', 'Moyle1_IND-ELEC-5to100-Run1.LAS', 'Moyle1_IND-ELEC-5to100-Run2.LAS', 'Moyle1_SONIC-2to100-Run1.LAS', 'Moyle1_SONIC-5to100-Run1.LAS', and 'Moyle1_SONIC-5to100-Run2.LAS'. At the bottom, there are buttons for 'Download Selected', 'Add to Request', 'Clear Requests', and 'Submit Request'.

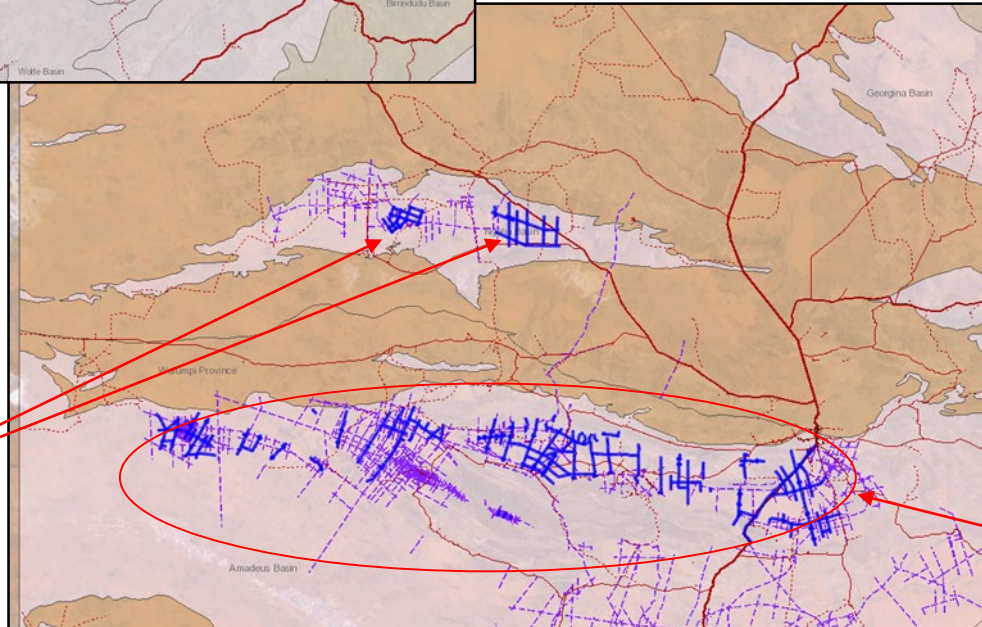
Recently digitised seismic surveys

BNT81 2D SS 1981

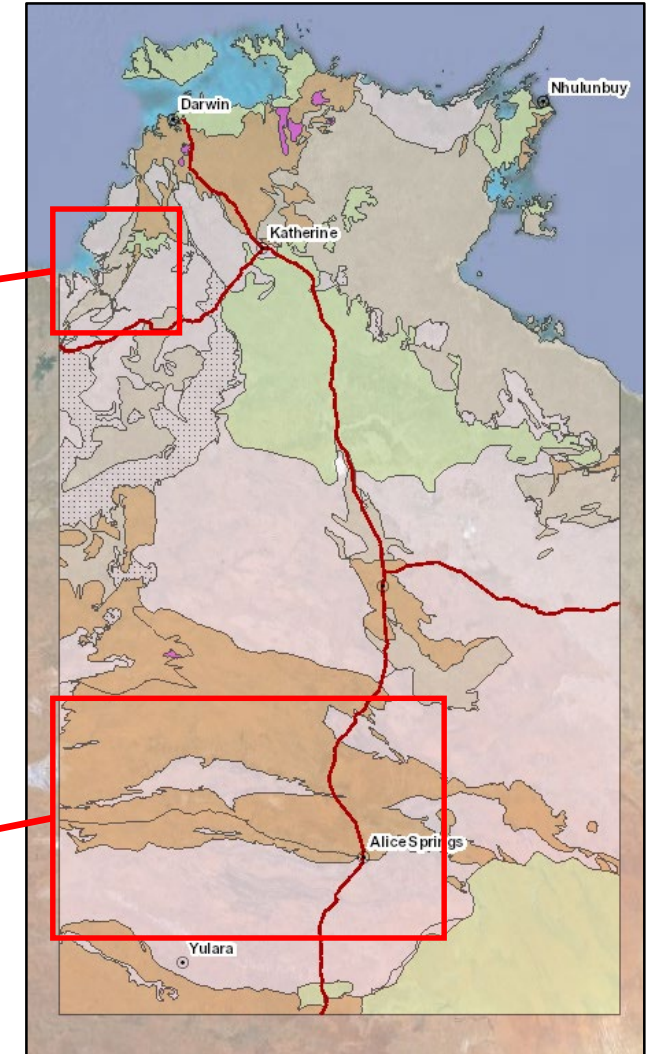
Keep River 2D SS 1968



New Haven - Mt Allan 2D SS 1981

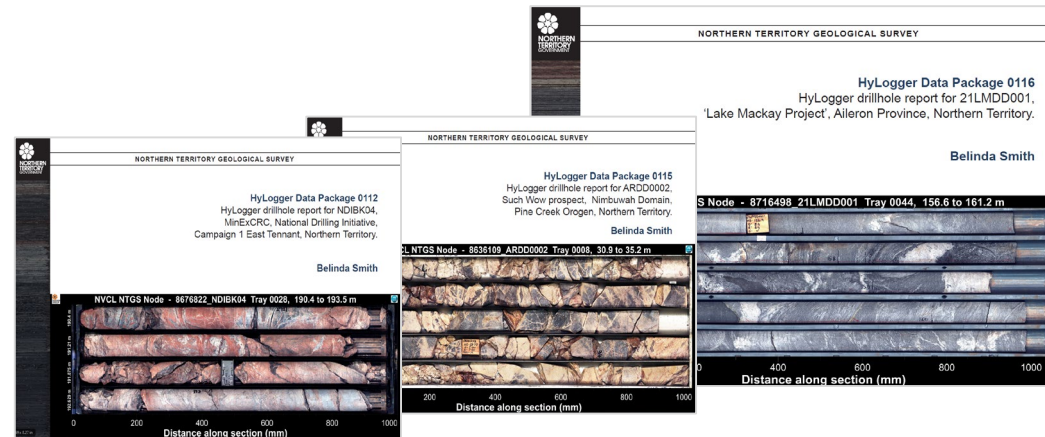
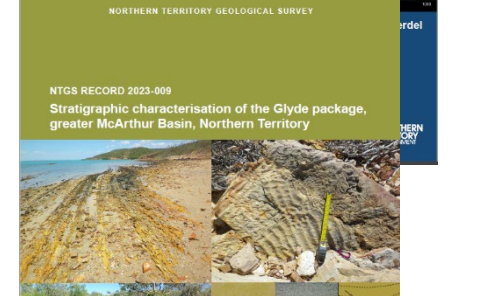
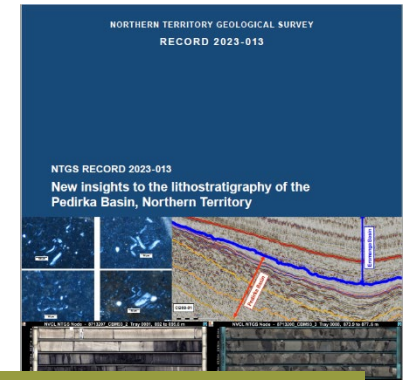
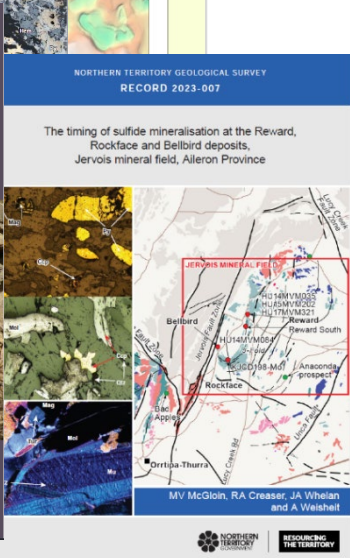
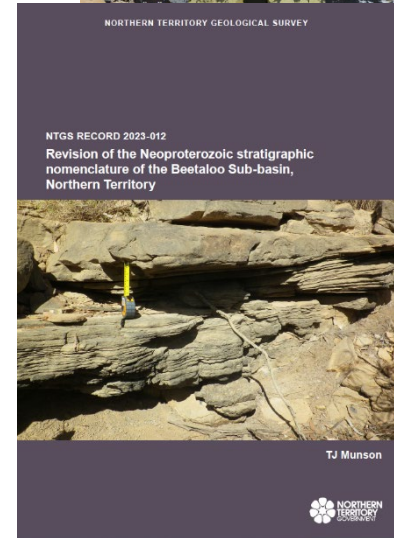
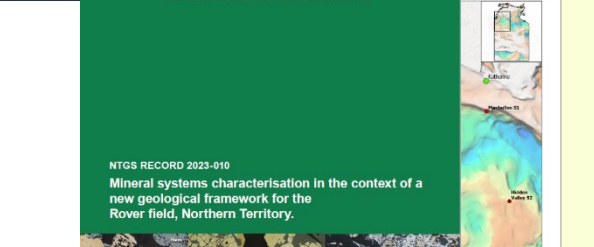
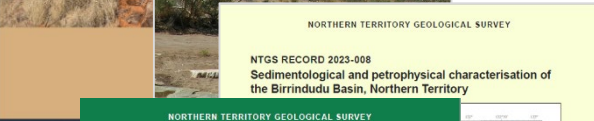
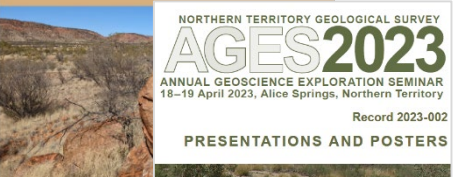
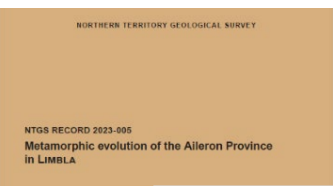


Missionary Plain 2D SS 1965 / Mt Rennie Ooraminna 2D SS 1966



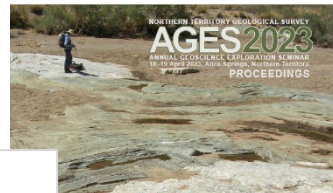
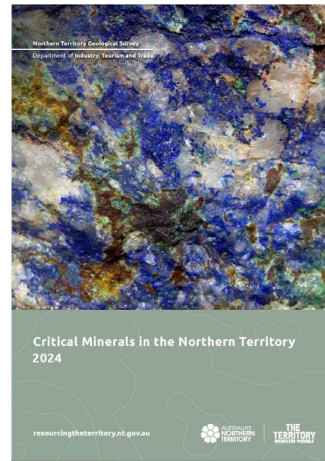
Recent and new releases

- 15 Records including:
 - Metamorphic evolution of the Aileron Province in LIMBLA
 - Timing of the sulfide mineralization at Reward, Rockface and Bellbird deposits, Jervois mineral field
 - Revised stratigraphic nomenclature in the Beetaloo Sub-basin
 - Stratigraphic characterization of the Glyde package, greater McArthur Basin
 - New insights to the lithostratigraphy of the Pedirka Basin
- 5 HyLogger Data Packages



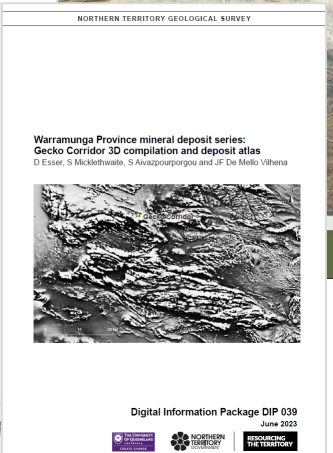
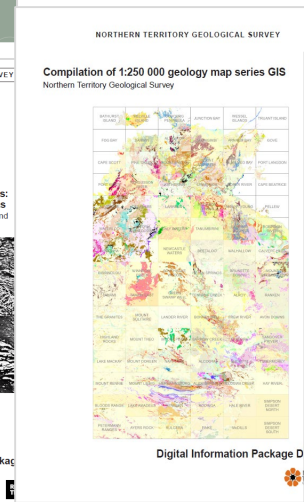
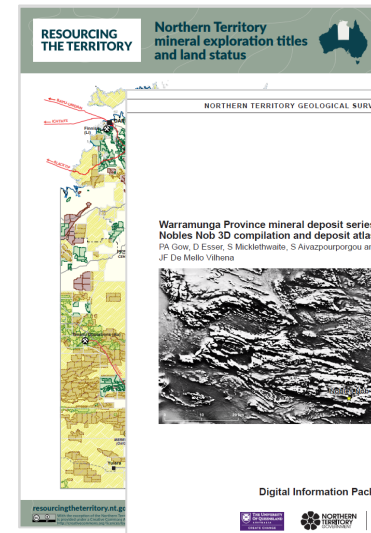
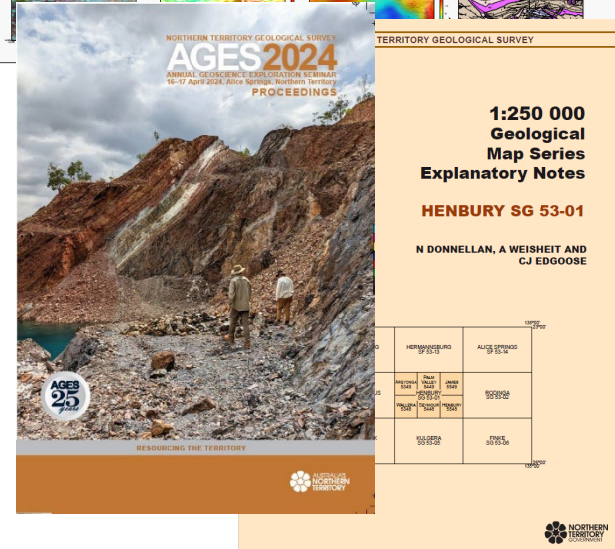
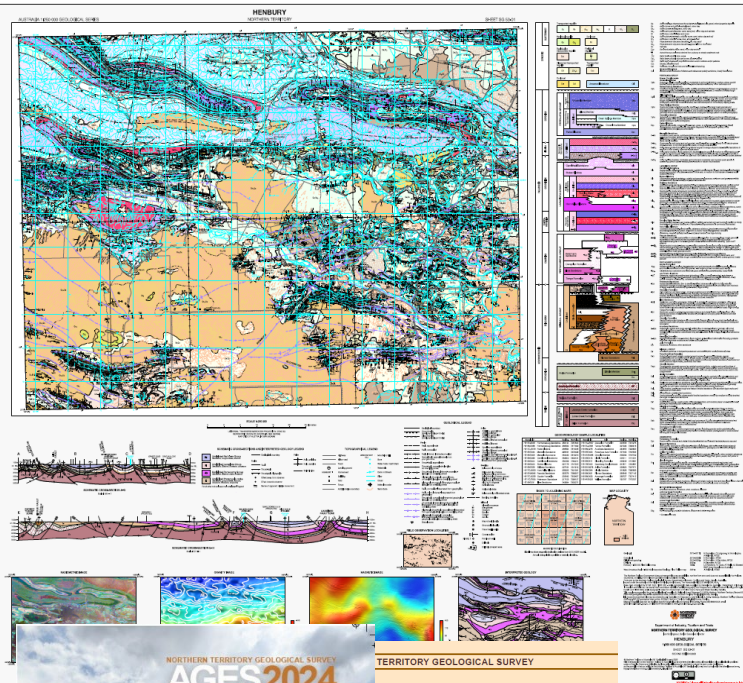
Recent and new releases

- Henbury 250k geological map, explanatory notes and GIS dataset
- Critical minerals in the Northern Territory (2024)
- DIP 041 – Compilation of 1:250 000 geology map series GIS
- DIP 042 – Compilation of pre-competitive NTGS geochemistry
- DIP 039, 040 - Warramunga Province mineral deposit series: 3D compilation and deposit atlases for Gecko Corridor and Nobles Nob
- Final data for the NTGS Pedirka Ground Gravity Survey
- Regular updates to RTT maps and fact sheets



Just released

- AGES 2024 Proceedings
- DIP001 April 2024
- NT wide gravity gridded data (2024)
- NT wide gravity map (2024)



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